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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,241	04/12/2004	Susan Gaye Elkington	200401303-1	4068

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EXAMINER
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NAM, HYUN

ART UNIT	PAPER NUMBER
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2109

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/27/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/823,241

Applicant(s)

ELKINGTON ET AL.

Examiner

Hyun Nam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 4/12/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

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1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 19-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The phrase, 'medium having a computable readable program' in the claims 19-21 is a non-statutory subject matter (see MPEP 2106.01) because definitions found in the disclosure did not exclude an unpatentable medium such as an electromagnetic carrier signal which is not a "process, machine, manufacture, or composition of matter." Also, language "capable of" lacks utility because claim does not require anything ever be done.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Use of the phrase 'critical resource queue' in claims 1-21 fails to distinctly claim the invention because there is nothing in the claiming language that determines the criticality of the resources. Matter of fact, there is nothing in the claiming language that determines the content of queue. For the purpose of this examination, the phrase 'critical resource queue' is construed to mean a queue and it will be further construed that the queue will operate with data (i.e. pop, push, and hold data).

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Use of the phrase 'high level' in claims 1-7 and 19-21 fails to distinctly claim the invention because word 'high' seems to quantify but does not. For the purpose of this examination, the phrase 'high level' is construed to mean a level.

Use of the phrase 'high consumption condition' in claims 8-18 fails to distinctly claim the invention because word 'high' seems to quantify but does not. Additionally, the word consumption is unclear. There is no indication of what might be construed as consumed. For the purpose of this examination, the phrase 'high consumption condition' is construed to mean a condition.

Use of the phrase 'preventing subsequent commands' (in claims 1-7), 'prevents subsequent commands' (in claims 8-18), and 'prevent subsequent commands' (in claim 19-21) fails to distinctly claim the invention because it is not clear what is being prevented. Also, it is not clear what are subsequent commands. For the purpose of this examination, the above phrases are construed to mean 'disabling queue', 'disables queue' and 'disable queue' respectively.

Use of the phrase 're-enabling commands' in claims 1-7 and 9 fails to distinctly claim the invention because it is not clear how commands are being re-enabled. It is not even clear that command messages are in the queue. For the purpose of this examination, the phrase 're-enabling commands' is construed to mean re-enable a queue.

Use of the phrase 'enabling commands' (in claims 3) and 'enabling subsequent commands' (in claims 14) and 'enables subsequent commands' (in claim 18) and 'enable commands' (in claim 19-21) fails to distinctly claim the invention because it is

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not clear how commands are being enabled. It is not even clear that command messages are in the queue. For the purpose of this examination, above phrases are construed to mean enabling queue, enables queue, and enable queue respectively.

Use of the phrase 'client/server combination' (in claims 1-7 and 16-21), 'adapter/LUN combination' (in claims 8-14), and 'source/client combination' (in claim 15) fails to distinctly claim the invention because it is not clear how, why and when server, source, client, adapter and LUN are combined. For the purpose of this examination, above phrases will be construed to mean source and/or destination.

Use of the phrase 'queuing order' (in claims 1-7 and 19-21) and 'queue order' (in claims 14 and 18) fails to distinctly claim the invention because it is not clear what method queue will be processed (i.e. FIFO, LIFO) in. For the purpose of this examination, above phrases will be construed to mean any order.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al. (US Publication Number 2003/0041115).

On claim 1, Chen et al. teaches a method of managing critical resource usage comprising: monitoring queue depth (see Abstract, Line 2) in at least one critical resource queue (see Abstract, Line 1) for a predetermined high level of resource

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consumption (see Abstract, Line 3); preventing subsequent commands (see Figure 3 Statement Block 300) of a client/server combination in response to a command that increases resource consumption to the predetermined high level; queuing an identifier (see Figure 2 PID1 212) of the client/server combination on a waiting queue (see Figure 2 Swept List 204); removing the client/server combination identifier from the waiting queue in queuing order as resource consumption declines (see Abstract, Line 7 and 8); and re-enabling commands of the client/server combination (see Abstract, Line 8 and 9).

On claim 2, Chen et al. teach the method according to claim 1 further comprising: managing critical resource usage for clients that require a specific resource (see Title; Note, memory is a finite resource in a system).

On claim 3, Chen et al. teach the method according to claim 1 further comprising: enabling commands of a client/server combination in order of queuing as resource availability is restored (see Abstract, Line 8 and 9).

On claim 4, Chen et al. teach the method according to claim 1 further comprising: receiving a command from a client to a server that increases consumption of a resource to a high consumption condition (see Abstract, Line 3); setting a flag indicative of a critical condition of the resource (see Paragraph 25 Line 13-16; Note, if no pointer is set then no swept has occurred and no critical condition has occurred); allowing the command to complete (see Abstract, Line 8 and 9); and rejecting subsequent commands issued by the client to the server (see Figure 3 Block 300).

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On claim 5, Chen et al. teach the method according to claim 1 further comprising: detecting an increase in consumption (see Abstract Line 3) of a resource to a level above a pre-selected limit (see Page 2, Paragraph 31, Line 1-3; Note, updating count variable can quantify queue usage); and queuing an identifier (see Figure 2 PID1 212) of the client/server combination on a waiting queue associated with the resource.

On claim 6, Chen et al. teach the method according to claim 5 further comprising: detecting a decline in consumption of the resource (see Abstract Line 7-8); removing a client/server combination identifier from the waiting queue in the queue order (see Abstract Line 8-9); and enabling subsequent commands of the client/server combination removed from the waiting queue (see Figure 7 Block 704).

On claim 7, Chen et al. teach the method according to claim 1 implemented in a storage system (see Title; Note, Memory) further comprising: at least one storage controller (see Figure 1B MQMANAGER 120); at least one host adapter operational as a client (see Figure 1A RECEIVER 104); at least one storage array configured as physical storage (see Figure 1A MEMORY 110) and logical storage (see Figure 1A TRANSMISSION QUEUE 111), the logical storage being arranged in logical units (LUNs; DESTINATION QUEUE(S)) operational as servers (see Figure 1A SENDER 102); at least one adapter/LUN combination operational as a client/server combination (see Figure 1A); and at least one resource selected from a group consisting of dynamic caching structures, queues (see Figure 1A), buffers, and remote copy resources.

On claim 8, Chen et al. teaches a storage system (see Title; Note, Memory) comprising: at least one storage controller (see Figure 1B MQMANAGER 120) capable

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of controlling data transfers (see Figure 1A) between at least one host adapter and at least one storage array configured as physical storage (see Figure 1A MEMORY 110) and logical storage (see Figure 1A TRANSMISSION QUEUE 111), the logical storage being arranged in logical units (LUNs; DESTINATION QUEUE(S)); at least one resource utilized in the data transfers (see Figure 1A MEMORY 110); at least one critical resource queue respectively associated with the at least one resource (see Figure 1A TRANSMISSION QUEUE 111) and capable of queuing accesses to the associated resource (see Figure 1A CHANNEL 106 and DESTINATION QUEUE(S)); and a logic that monitors (see Abstract, Line 1) the at least one critical resource queue (see Abstract, Line 2 and 3) for a predetermined high consumption condition (see Abstract, Line 3), identifies an adapter/LUN (see Figure 2 PID1 212) combination associated with a command that contributes to the high consumption condition, queues the identified adapter/LUN combination on a waiting queue (see Figure 2 SWEPT LIST 204), and prevents subsequent commands of the identified adapter/LUN combination (see Figure 3 Statement Block 300).

On claim 9, Chen et al. teach the storage system according to claim 8 further comprising: a logic that detects a decline in resource consumption (see Figure 7 block 700), dequeues the adapter/LUN combination identifier from the waiting queue (see Figure 7 block 704), and re-enables commands of the dequeued adapter/LUN combination (see Abstract Line 9; Note, once message is placed back in the queue it is an active message).



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On claim 10, Chen et al. teach the storage system according to claim 8 further comprising: at least one resource selected from a group consisting of dynamic caching structures, queues (see Title), buffers, and remote copy resources.

On claim 11, Chen et al. teach the storage system according to claim 8 further comprising: a logic that manages critical resource usage for host adapters that require a specific resource (see Title; Note, memory is a finite resource in a system).

On claim 12, Chen et al. teach the storage system according to claim 8 further comprising: a logic that detects receipt of a command from an adapter to a LUN that increases consumption of a resource above a preselected limit (see Abstract, Line 2 and 3), sets a flag indicative of a critical condition of the resource (see Paragraph 25 Line 13-16; Note, if no pointer is set then no swept has occurred and no critical condition has occurred), allows the received command to complete (see Abstract Line 9; Note, once message is placed back in the queue it is an active message), and rejects subsequent commands issued by the adapter to the LUN (see Figure 3 Statement Block 300).

On claim 13, Chen et al. teach the storage system according to claim 8 further comprising: a logic that detects (see Abstract, Line 1) an increase consumption of a resource above the preselected limit (see Abstract, Line 3), and queues an identifier of the adapter/LUN combination on a waiting queue (see Figure 2 Swept List 204) associated with the resource.

On claim 14, Chen et al. teach the storage system according to claim 13 further comprising: a logic that detects a decline in consumption of the resource (see Abstract 7

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and 8), removes an adapter/LUN combination identifier from the waiting queue in the queue order, and enables subsequent commands of the adapter/LUN combination removed from the waiting queue (see Figure 7 Block 704).

On claim 15, Chen et al. teaches a data handling system (see Figure 1B OPERATING SYSTEM) comprising: at least one controller (see Figure 1B MQMANAGER 120) capable of controlling data transfers between at least one client (see Figure 1A RECEIVER 104) and at least one server (see Figure 1A SENDER 102); at least one resource utilized in the data transfers (see Figure 1A MEMORY 110); at least one critical resource queue (see Figure 2 FRONT MESSAGE LIST 202) respectively associated with the at least one resource (memory) and capable of queuing accesses to the associated resource (see Figure 2 SWEPT LIST 204); and a logic that monitors (see Abstract, Line 1) the at least one critical resource queue for a predetermined high consumption condition (see Abstract, Line 3), identifies a source/client combination (see Figure 2 PID1 212) associated with a command that contributes to the high consumption condition, queues the identified source/client combination on a waiting queue (see Figure 2 SWEPT LIST 204), and prevents subsequent commands of the identified source/client combination (see Figure 6 Block 600).

On claim 16, Chen et al. teach the system according to claim 15 further comprising: a logic that detects (see Abstract Line 1) receipt of a command from a client to a server that increases consumption of a resource above a preselected limit (see Abstract Line 3), sets a flag indicative of a critical condition of the resource (see

Paragraph 25 Line 13-16; Note, if no pointer is set then no swept has occurred and no critical condition has occurred), allows the received command to complete (see Abstract Line 7-9), and rejects subsequent commands issued by the client to the server (see Figure 3 Block 300).

On claim 17, Chen et al. teach the system according to claim 15 further comprising: a logic that detects an increase in consumption of a resource above the preselected limit (see Abstract Line 1), queues an identifier of the client/server combination on a waiting queue associated with the resource (see Figure 2 PID1 212).

On claim 18, Chen et al. teach the system according to claim 17 further comprising: a logic that detects a decline in consumption of the resource (see Abstract Line 7 and 8), removes a client/server combination identifier from the waiting queue in the queue order (see Figure 7 Step 704), and enables subsequent commands of the client/server combination removed from the waiting queue (see Abstract Line 9).

On claim 19, Chen et al. teaches an article of manufacture comprising: a controller usable medium having a computable readable program code embodied therein for managing critical resource usage, the computable readable program code (see Paragraph 53) further comprising: a code capable of causing the controller (see Figure 1B MQMANAGER 120) to monitor for a predefined high level of resource consumption (see Abstract Line 1); a code capable of causing the controller to prevent subsequent commands (see Figure 6 Step 6) of a client/server combination (see Figure 1A SENDER and RECEIVER) in response to a command that increases resource consumption to the predefined high level (see Abstract Line 3); a code capable of

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causing the controller to queue an identifier (see Figure 2 PID1 212) of the client/server combination on a waiting queue (see Figure 2 SWEPT LIST 204); a code capable of causing the controller to remove the client/server combination identifier from the waiting queue in queuing order as resource consumption declines (see Figure 7 Step 704); and a code capable of causing the controller to enable commands of the client/server combination (see Figure 3 Step 306).

On claim 20, Chen et al. teach the article of manufacture according to claim 19 further comprising: a code capable of causing the controller to manage critical resource usage for clients that require a specific resource (memory); a code capable of causing the controller to receive a command from a client to a server that increases consumption of a resource above a preselected limit (see Abstract Line 3); a code capable of causing the controller to set a flag indicative of a critical condition of the resource (see Paragraph 25 Line 13-16; Note, if no pointer is set then no swept has occurred and no critical condition has occurred); a code capable of causing the controller to allow the command to complete (see Abstract Line 9); and a code capable of causing the controller to reject subsequent commands issued by the client to the server (see Figure 6 Step 600).

On claim 21, Chen et al. teach the article of manufacture according to claim 19 further comprising: a code capable of causing the controller to detect (see Abstract Line 1) an increase in consumption of a resource above a preselected limit (see Abstract Line 3); a code capable of causing the controller to queue an identifier (see Figure 2 PID1 212) of the client/server combination on a waiting queue (see Figure 2 SWEPT

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LIST 204) associated with the resource; a code capable of causing the controller to detect a decline in consumption of the resource (see Abstract Line 7-9); a code capable of causing the controller to remove a client/server combination identifier from the waiting queue in the queue order (see Figure 7 step 702); and a code capable of causing the controller to enable subsequent commands of the client/server combination removed from the waiting queue (see Figure 7 Step 704).


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hyun Nam whose telephone number is (512) 270-1725. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Robertson, can be reached on 571-272-4186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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20 February 2007



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